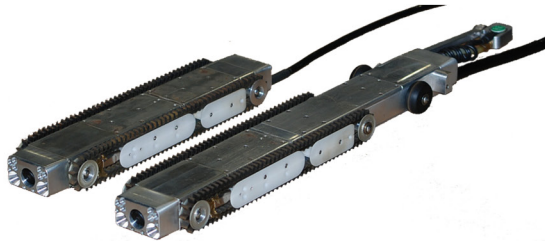


MICRO MAGNETIC CASED PIPE INSPECTION ROBOT

Robotic Internal Inspection Device for Cased Pipe

MCC Type 1 & Type II Crawlers



The MMC Performs Inspection of Cased Pipe to Collect Data Required By DIMP

New federal pipeline integrity rules require utility companies to evaluate thousands of gas mains buried beneath highways, railroad tracks and airport runways – each and every one cased inside a larger pipe. The MMC Pipe Inspection Robots defy gravity by magnetically attaching to the metallic casing pipe enabling them to crawl hundreds of feet into tight annular spaces. Front and rear mounted video cameras provide real-time, full motion video of the outer surface of the cased gas main. Pitch and roll sensors allow for remote navigation and provide the precise location of defects and anomalies. This allows for identifying threats, assessing and prioritizing risks.

Applications

Inspection of cased pipe including:

- Integrity of pipeline coating including delamination, holes, and other defects
- Integrity, composition, & spacing of pipe line insulators
- Quantity and location of debris & water within the annular space including location of electrical shorts
- Atmospheric conditions within the annular space
- Pipe Wall Thickness Measurements

Know Your Pipelines

The ULC Robotics Micro Magnetic Cased Pipe Inspection Robot (MMC) provides gas companies with live, high resolution inspection of cased pipe. The remote controlled tethered robot is light weight yet powerful. Using the MMC gas companies can assess cased pipe from within the annular space to locate damaged spacers, shorts, and determine the condition of carrier pipeline coating. It can also verify if debris or water have infiltrated the casing. The MMC type II also contains sensors which allow it to acquire spot wall thickness measurements and to measure the temperature and humidity within the annulus.



High Resolution Video and Sensor Package

Using the MMC's high resolution video cameras and sensor package, the gas main's external coating, and environmental conditions inside the annular space, can be accurately assessed so that the distribution pipeline operator can know its cased pipe; identify existing or potential threats caused by deteriorating cased pipe; assess, and prioritize risks associated with cased pipe and identify and implement measures to mitigate these risks.

Small Size

The crawler's compact size allows it to travel in between spacers and in annular space as small as 1 1/4".

Professional Inspection Services

ULC Robotics will help you plan your next pipeline inspection project and provide professional inspection services using the Micro Magnetic Cased Pipe Inspection Robot. Pre-project planning assisted by ULC can help you maximize the benefits of cased pipe inspection. As part of our inspection services, ULC will provide video recordings in the format of your choice as well as detailed reports and documentation designed to aid in the engineering evaluation of your pipelines.

In addition, the MMC type I and II can be purchased directly from ULC Robotics. We will train and provide support services for the equipment as needed.

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Innovative pipeline inspection and
rehabilitation equipment and services

MICRO MAGNETIC CASED PIPE INSPECTION ROBOT

Robotic Internal Inspection Device for Cased Pipe

Features

- Perform inspections in annular spaces as small as 1-1/4" high.
- Crawler is magnetically attached to the casing pipe to inspect the carrier pipe at several exterior clock positions.
- A cleaning system prevents buildup of debris within the tracks.
- Crawler can navigate past spacers and small gaps.
- User Interface displays video, distance, pitch, roll, spot wall thickness & video based measurement data.
- Crawler can travel up to 250 feet.

The type II crawler has all of the above features as well as:

- Onboard sensors to determine pipe pitch, atmospheric conditions including temperature and humidity, and pipe wall thickness using ultrasonic thickness gage.
- Robotic pipeline inspection services are performed by ULC Robotics's trained technicians. The MMC type I or II Robot can also be purchased directly from ULC Robotics. Call us for more information.

Specifications

Environment

Minimum Annular Space: 1-1/4"
Casing Range: 12" dia. - 48" dia.

Camera

Description: Two high-resolution miniature cameras,
One forward looking, one back
Camera: 1/4 CMOS
Resolution: 420 lines, color
Light Sensitivity: 1 lux
Construction: Aluminum Housing

Monitors*

LCD Monitor: One 10.4" Sun Light Readable LCD
Resolution: 640x480

Crawler Motors

Drive Motors: Two 24-volt variable speed
Arm Motor: 3-volt motor+
DC Motor Controller: Current Limiting

Reel System

Description: Custom cable reel with 250' of cable
Distance Measurement: Encoder with digital display
Case: Fully enclosed in a shipping quality case

Couplant Pump System*

Max Pressure: 1000 psi
Case: Fully enclosed in a rugged shippable case

Control System

Description: Custom integrated laptop with GUI for data recording and robot control+
Custom control case with LCD monitor*
Model: Panasonic Toughbook+

Sensors+

Temperature Sensor: Environmental Temperature Sensor
Accuracy: ± 2 °F
Humidity Sensor: Environmental Humidity Sensor
Accuracy: ± 3 % Relative Humidity
Pitch/Roll Sensor:
Accuracy: ± 1 °
Wall Thickness Sensor:
Accuracy: up to ± 0.001 inches, dependent on material

Legend: * Specific to Type I Crawler System
+ Specific to Type II Crawler System

MMC Type I System



MMC Type II System